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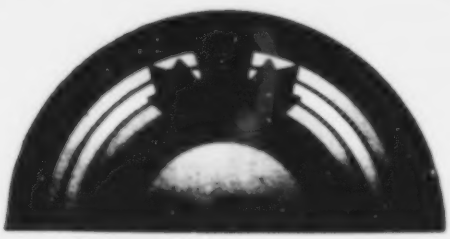

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Canada

INLAND WATERS DIRECTORATE
ATLANTIC REGION

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REPORT ON A SURVEY OF NOVA SCOTIA NEWSPAPERS FOR WATER-RELATED TOPICS FOR THE PERIOD 1979-1984

By

JOHN HART

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ABSTRACT

This report is a summary of the prominent inland water issues in Nova Scotia as suggested by a newspaper survey covering the period from 1979 to 1984.

The report includes the significant elements of the press coverage for each inland water-related issue accompanied by tables and map figures where appropriate, and concludes with an assessment of the survey's success in determining and shedding light on these issues.

RESUME

Ce rapport est un sommaire des problèmes marquants des eaux intérieures de la Nouvelle-Ecosse tel que suggéré par une recherche dans les journaux couvrant la période de 1979 à 1984.

Le rapport inclus les éléments importants couverts par la presse pour chaque problème relié aux eaux intérieures accompagnes par des tables et des cartes lorsque approprié, et conclut avec une évaluation du succès de la recherche à déterminer et éclaircir ces controverses.

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1. INTRODUCTION

1.1 Background

This report is the outcome of a project initiated by the Water Planning and Management Branch of the Inland Waters Directorate as part of the Environment 2000 Program to augment the Branch's awareness of inland water-related issues in Nova Scotia.

An Environment 2000 employee in Halifax was directed to survey the Halifax Chronicle-Herald for the years 1979 to 1984 for all articles concerned with water-related topics. (A gap in coverage occurred between March 1979 and February 1980 due to time constraints.) These articles were referenced by the name of the publication, date, page, and article headline, followed by a summary or precis of the article. Articles were then compiled under the broad categories of water quantity, water quality and water use. These activities were carried out between May 7 and October 5, 1984, resulting in 553 clipping summaries being forwarded to the Water Planning and Management Branch at the project's conclusion. A report did not accompany the clippings due to the mass of material and limited time available. For this reason, a contract writer was engaged to make a detailed study of the material and to issue a final report.

1.2 Methodology

The following is an issue by issue treatment of the clipping information. The criteria for establishing an issue, and the consideration it merited, were (1) the extent of coverage, (2) the character of that coverage, and (3) the number of people affected. The issues receiving the most attention in this report, such as Municipal Infrastructure and Inland Water Contamination,

met all three criteria. Other issues, for example Energy Water Use, were accorded comparatively brief treatment despite their receiving substantial coverage, because this coverage was often devoted to matters of limited relevence to inland water concerns, such as the construction details of the Annapolis River Tidal Power Project. Thus, the type of information contained in the coverage of individual issues influenced the depth of treatment they received in this report.

It is not suggested here that the issues discussed below are the only inland water concerns in Nova Scotia. They comprise, however, as complete an overview as possible of what 553 articles covering the last five years indicate are the major inland water-related concerns in the province.

2. MUNICIPAL WATER INFRASTRUCTURE

This subject received substantial coverage (205 articles), with virtually every region of the province earning mention under one or more of the headings below. The bulk of the coverage was focused on a growth in local awareness of the need to protect municipal water supplies, on water-sewer problems caused by age and increased usage, and on the often dramatic rises in municipal water rates needed to generate funds for required improvements.

2.1 Water Supply Management and Protection

In the 41 articles concerned with this topic, there was clear evidence of it becoming an issue of increasing importance among government officials, the media, educational institutions, and the general public between 1980 and 1984. The particular concerns most often stated

in these clippings were the protection of local water resources from pollution and contamination, and the need for long range watershed management planning. Among the methods of addressing these concerns, as seen in the clipping information, were municipal attempts to gain control of local watershed lands from the province or county, the use of watershed management studies and plans, the purchase or annexation of watershed lands, and the use of by-laws, zoning regulations, and other legislation to provide protection.

The following is a year by year summary of comment and activities related to the protection, control, and management of watershed lands and resources for the survey period. Locations are in alphabetical order within each year's coverage. A summary figure follows.

1979: No References.

1980: - Lunenburg County: (#521, March 10)-The Lunenburg County District Planning Commission announced its intention to seek responsibility for watershed management in the county from the province to ensure the protection and proper utilization of its water resources.

No evidence of public discussion in this year.

1981: - Lunenburg County: (#522, December 30)-The County initiated a water resources management study to aid in long range planning for these resources.

- Truro: (#469, September 5)-The town of Truro indicated plans to annex watershed lands outside its boundaries in order to control commercial and industrial development near its water sources.

No evidence of public discussion in this year.

1982: - Elmsdale: (#457, February 12)-The village rate payers association was locked in a dispute with a local scrapyard operation over the company's alleged role in the contamination of the nearby Shubenacadie River, a local source of drinking water.

- New Glasgow: (#430, February 25)-The town of New Glasgow announced it had negotiated a watershed management agreement with the Scott Paper Company, the area's largest industry.

- Truro: (#472, #492, February 2)-The Truro Town Council sought provincial funding for a watershed management study to undertake mapping, field inspections, laboratory testing and data analysis. The study was also to investigate the possibility of leachate contamination from a local landfill site, and surface water contamination from sewage disposal systems. (#473, March 13)-The Town Council indicated it would continue to purchase as much watershed land "as finances would allow." (#476, April 16)-Town officials announced the purchase of 300 acres of additional land for its watershed. (#475, no specific date provided.)-The Public Utilities Board approved municipal control of watershed lands annexed by the town from the county.

- Public Discussion: (#357, January 6)-An editorial page article urged proper watershed management to preserve Nova Scotia's water resources. (#470, January 5)-The Chairman of the Public Utilities Board stated that watershed

management problems in Nova Scotia were due to conflicting interests among landowners, land users and municipalities, and to poor communication among the responsible agencies in the three levels of government.

1983: - Halifax: (#359, January 31)-The Technical University of Nova Scotia's Centre for Water Resources Studies launched a watershed study of lakes and their surrounding lands in a changing urban area in order to develop mathematical models for watershed management purposes.

- Kentville: (#507, no specific date)-The town council purchased 23 acres of land surrounding a local sewage treatment plant to act as a buffer for area water supplies.

- Truro: (#480, February 8)-The town council announced plans to annex an additional 7.5 square miles of land for its watershed. (#482, June 1)-Science students at a local junior high school undertook a project testing water quality in the town's watershed areas. (#484, December 14). The town council appointed a committee for its watershed management study.

- Public Discussion: (#361, September 20)-At a public hearing in Halifax, an official of Environment Canada's Inland Waters Directorate called for a regional approach to water resources management planning to both prevent contamination and increase public awareness of the issue. (#67, September 2)-The local MLA complained to the N. S. Minister of Environment about the lack of action on unspecified water quality and

watershed management problems in Hants County. (#69, October 18)-A Milford (Hants County) businessman called for measures to protect the Shubenacadie River and its tributaries, as a major local source of drinking water, from the effects of industrial pollution.

1984: - Amherst: (#435, October 6)-The town of Amherst launched a watershed management study to provide information for future decisions regarding commercial or industrial developments on or near the town's watershed lands.

- Barrington: (#502, September 4)-The Municipality of Barrington applied to the Provincial Department of Environment for a waste water management study.

- Dartmouth: (#42, August 30)-The City Engineer urged changes to the City's subdivision regulations to permit municipal control over excavation work done on private property near watershed areas. At the time, city regulations came into effect only during the construction phase, resulting in the city being unable to control drainage and run-off from excavation sites.

- Middleton: (#516, February 1)-The town of Middleton and the County of Annapolis announced the formation of a joint watershed management committee to study the area's potable water supply and aid in future planning.

- New Waterford: (#416, February 4):The town of New Waterford sought to have its water resources designated as a watershed under the Nova Scotia Water Act in order to protect its water supply from industrial development and woodcutting operations.

- Shelburne: (#531, October 12)-The town and county of Shelburne announced plans to form a committee to pursue a protection plan for the town's watershed area.

- Sydney: (#419, June 21):Municipal officials indicated that the town was prepared to go to court to prevent residential construction on its watershed land. They stated that if municipal attempts to re-zone the land failed, the town would expropriate.

- Truro: (#485, January 4)-The Mayor announced that the town's major project for 1984 would be the annexation of 5000 acres of land for its watershed. (#492, May 22)-Consultants were hired and the town's watershed management study began. (#493, May 30)-For the second year, science students at a local junior high school undertook a project testing water quality in the town's watershed areas. (#498, August 14)-The Truro Town Planning Advisory Committee considered an amendment to the Municipal Planning Strategy prohibiting commercial or industrial activity on newly acquired watershed lands.

- Windsor Junction: (#454, September 11)-Area residents formed an association to protest a zoning decision permitting industrial activity near local lakes and water courses.

- Public Discussion: (#7, May 28)-A local MLA expressed concern about pollution in the Enfield-Elmsdale-Lantz area along the Shubenacadie River, a source of drinking water for those communities.

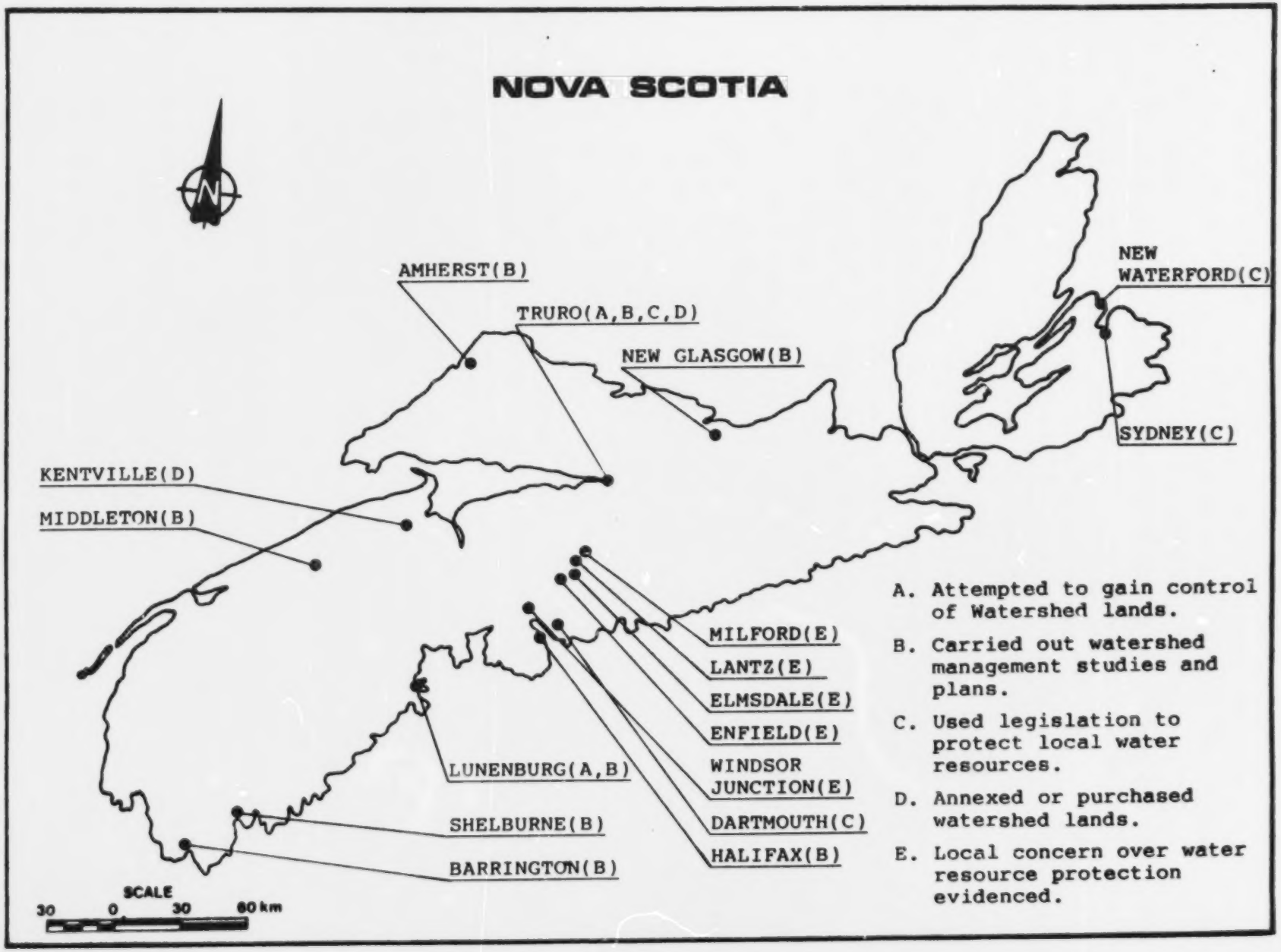

FIG. 1 WATER SUPPLY MANAGEMENT AND PROTECTION SUMMARY

2.2 Problems Related to Water-Sewer Systems

Although a lack of services was indicated as the source of difficulties in a few cases of improper sewage disposal, the majority of water-sewer system problems experienced by Nova Scotians, according to the clipping information (66 articles), were due to the aged condition of these systems combined with an increase in the number of users, particularly commercial users such as fish plants. As a result of this state of affairs, a number of serious water shortages occurred when increasingly inadequate water supplies were over-used, or when already weak delivery systems broke down under added stress. In June, 1982 (#358), the provincial Minister of Municipal Affairs stated, "it would take $70 million just to take care of urgent water supply problems." And a newspaper editorial in August, 1984 (#363) lamented the province's "outmoded water distribution and sewage collection systems," urging immediate action before the situation worsened and remedial costs rose. However, despite an apparent concensus on the need for such action, federal and provincial restraint measures seriously limited the required financial resources (#441, #442). The only article covering a possible future alternative solution to shortages concerned a research program at the Technical University of Nova Scotia looking into rain water as a potential potable water source (#9, #360, #370).

In the following, where capital projects were initiated in response to specific water-sewer problems, the relationship was noted and a reference number for further information provided.

2.2.A. Overall System Inadequacy

Five of the six communities below suffered serious water shortages when their existing water supply and/or delivery systems proved unable to meet the needs of the local population and industries. The other case involved a village lacking a proper sewage disposal system. In these instances, alternative water supplies and new delivery and/or sewage systems were the only permanent solutions, according to the clipping information (35 articles). Of these six cases, four remained unsettled at the time of the survey's conclusion. It should be noted that the water shortage situation occurring in Liverpool at the time of this report's writing developed subsequent to the survey period, and is not considered here. Population figures are taken from the 1981 Census of Canada, and a summary figure for Sections 2.2.A, 2.2.B, 2.2.C and 2.2.D. is provided at the end of Section 2.2.

- Digby, population 2558, clipping No.'s 517-520, September 24, 1980 - December 6, 1982. With a history of water supply problems, a serious situation developed in Digby during the summer of 1980 when the reservoir dropped to "very low" levels and only one of two municipal wells was in operation. Residents were asked to take conservation measures and boil their water due to high bacteria levels (source unspecified). The Mayor stated that the present system could not meet the town's needs, especially those of local fish plants, and sought federal assistance for "a new water supply system" estimated to cost $1 million (#520). There were no further references

to the Digby situation in the clippings. It will be seen in Section 2.3 (Census District 03) that the town received a small federal grant for water system improvements. However, this did not appear to alleviate the problem since the final article indicated a continuing water shortage.

- Joggins, population 592, clipping No.'s 432-434, January 29, 1981 - October 2, 1981. This Cumberland County community completely lacked a sewage disposal system in January, 1981, resulting in raw sewage being dumped into roadside ditches. With the residents concerned about potential disease outbreaks and future village growth, a plebiscite was held on the construction of a new sewer system and treatment plant. Residents rejected the proposal because of the high cost, but reversed their stand when a "large" Municipal Affairs grant was offered (#434). The final article indicated construction tenders were being called (See Section 2.3, Census District 11.)

- Lequille, population 509, clipping No. 512, October 23, 1980. This village near Annapolis Royal appeared to be suffering from chronic water supply problems. The possibility of hooking into Annapolis Royal's system proved unfeasible when only eight residents indicated they would take advantage of the new water line due to the cost factor. The article suggested the only solution was the installation of a system of deep wells.

- Oxford, population 1470, clipping No.'s 449-450, November 1, 1980 - November 5, 1982. For reasons unstated, one of the town's three wells pumped

itself dry, resulting in the reservoir being virtually empty in November, 1980. With residents facing a water shut-off and the town without a fire-fighting capability, the town superintendent announced plans to seek financial aid for a new water supply. The only further reference to Oxford indicated the town was suffering shortages again in 1982, with no discussion of how and if the problem was solved.

- Springhill, population 4896, clipping No.'s 442-448, September 22, 1982 - November 9, 1983. Dry weather in September 1982 caused artesian wells to dry up and water levels in the town's water tanks to drop steeply. The town rented pumps to provide additional water from a nearby brook, but this was proving too costly. The problem was complicated by an only partially completed delivery system caused by a cut-off of federal funding (#442). Fearing an impending "emergency situation", in which local industries would have to shut-down, the town sought a meeting with the Minister of Municipal Affairs to arrange financing for a new water supply. The meeting took place in October, 1982, and for reasons unstated, the town was refused funding. In November a report from an unidentified source stated that the town required a larger watershed and two new reservoirs with delivery systems. An article from December (#447) indicated the town had cleaned out its supply lines and water levels were beginning to rise. This item also mentioned that residents had been boiling their water since August for unspecified reasons. The final

reference to Springhill's difficulties (#448) indicated that water levels were dropping again in late 1983, forcing conservation measures on both residents and local industries.

- Yarmouth, population 7475, clipping No.'s 533-550, January 8, 1980 - November 26, 1983. In early 1980, the town sought DREE funding to replace its 100 year old water system because of repeated large scale disruptions and an increased demand for water from local fish plants. When DREE's reaction proved unfavorable, the province offered an 85% - 15% cost sharing arrangement to fund a new system, estimated at the time to cost $5 million (see Section 2.3, Census District 02). Initially, the town refused, saying it could not afford its share without significantly increasing water rates, which were raised 65% just the previous year to fund improvements. However, clippings from early 1982 (#542, 543) indicated work on the new system was underway, with progress halted as a result of inflation driving the project's cost up to $6.4 million. Amid continuing serious disruptions ("situation is grave" #542), the town sent a delegation to Ottawa to secure additional financing. It is unclear whether this effort was successful or not; however, in August, 1982, work on the project was again proceeding. More disruptions occurred before the new system finally went on stream in November, 1983 (#550).

2.2.B. Partial System Inadequacy

The following four communities experienced water supply or sewage disposal problems which required, according to the 14 clippings covering these cases, the improvement or extension of existing water or sewer systems. The consequences were generally less severe than those seen above in section 2.2.A, though the Department of Health did become involved in two instances (Hantsport and Elmsdale). In two of the localities below (Herring Cove and Elmsdale), the problem appeared to have been resolved.

- Elmsdale, population 1172, clipping No.'s 458-459, November 26, 1983 - January 21, 1984. Residents of a subdivision in this village near Halifax were forced to boil their water in late 1983, and had been suffering from a shortage of potable water for several years due to inadequate treatment facilities. When the Department of Health prohibited further development in the area due to "poor soil conditions" (#458), the County Board of Health recommended the installation of a water treatment plant, which the County Council agreed to in early 1984 (#459). (See Section 2.3, Census District 09).

- Hantsport, population 1395, clipping No.'s 509-510, January 6 and March 12, 1983. A Department of Health report indicated that 13 of 29 sewage disposal systems in an unserviced area of the town were below standard, or were discharging effluent into a nearby brook. The report recommended extending the municipal sewer line to the area. Also, in early 1983, residents

in one area of the town were complaining about a lack of water pressure. A consultant's study indicated the situation seriously diminished fire protection, and suggested the only solution was replacement of the area's water line. There was no indication whether action was taken on either of the above recommendations.

- Herring Cove, population 1323, clipping No.'s 37-44, August 16, 1983 - September 11, 1984. With a sewage treatment station reportedly overflowing 40-42 times each year, and solid waste being discharged in another part of the community, the local rate payers association called for a public hearing to discuss the situation. However, jurisdiction became an issue, as Herring Cove lay within Halifax County boundaries while most of the untreated sewage in question came from the City of Halifax. The Premier ordered the city to clean up the problem in July, 1984, vowing to issue a ministerial order forcing action if necessary. After the expiry of the Premier's deadline, a meeting between provincial and City of Halifax officials resulted in the city moving ahead with construction of a sewage overflow retention tank (Section 2.3, Census District 09), with no mention of previous provincial demands for siltation prevention measures and installation of a filtration screen in Herring Cove. There were no further references to the matter.

- St. Peters, population 669, clipping No. 420, October 18, 1984. A part of this community, unserviced due to a canal barrier, was experiencing problems with effluent being

discharged into nearby Bras D'or Lake and rising to the surface near septic tanks. The article indicated that options being considered by County Council included the construction of new septic tanks and extending the village sewer line while the canal was drained for repairs.

2.2.C. System Component Malfunctions

Blockages due to calcification and debris, sewage leaks and equipment failures were the most common breakdowns covered in the clipping information (13 clippings). Generally, the consequences were not serious, although short term water shortages occurred in Halifax and Sydney, and a school closure was necessary in Port Hood. One article (#436) suggested Amherst's increasing electrical costs were a result of forcing water through calcified pipes. Others ascribed temporarily high bacteria counts in Truro to a broken sewer pump (#495), and similarly high counts in Shelburne to a chlorinator malfunction (#529). Typically, these problems were quickly remedied.

The age of the infrastructure was named as the cause of breakdowns in Sydney Mines and Amherst, and freezing temperatures were blamed for ruptured water mains in Halifax. Most often, though, the cause was not provided.

In only one case, that of Amherst was there a clear relationship between a breakdown and a subsequent capital project (Section 2.3, Census District 11), although Truro and Shelburne

received funding for improvements during the survey period (Section 2.3, Census District's 10 and 01, respectively).

The following table does not include malfunctions which occurred in communities already discussed in 2.2.A and 2.2.B.

TABLE NO. 1

COMPONENT MALFUNCTIONS AND NUMBER OF OCCURRENCES

LOCATION AND CLIPPING NUMBERS	SEWAGE LEAKS AND DISCHARGES	RUPTURED WATER MAINS	BLOCKAGES	OTHERS (SPECIFIED)
AMHERST #436			X (CALCIFICATION)	
BARRINGTON #502	X			
BRIDGEWATER #525			X (SEWAGE CLOG)	
HALIFAX #36, #451	X	X (4)		
PORT HOOD #413			X (DEBRIS)	
SHELBURNE #529				X (CHLORINATOR FAILURE)
SYDNEY #411				X (VALVE FAILURE)
SYDNEY MINES #378			X (CALCIFICATION)	
TRURO #481, 484, 490, 495	X	X (3)		X (PUMP FAILURE AND STORM DRAINAGE OVERFLOW)
WOODS HARBOUR #502	X			

2.2.D. Other Disruptions In Service

Other cases of interruptions in water services included wells running dry in Dartmouth when a city dam shut down (#453), the same thing occurring in Amherst when the town drilled a new well to service an industrial park (#439), and an incident of vandalism in Stewiacke (#58).

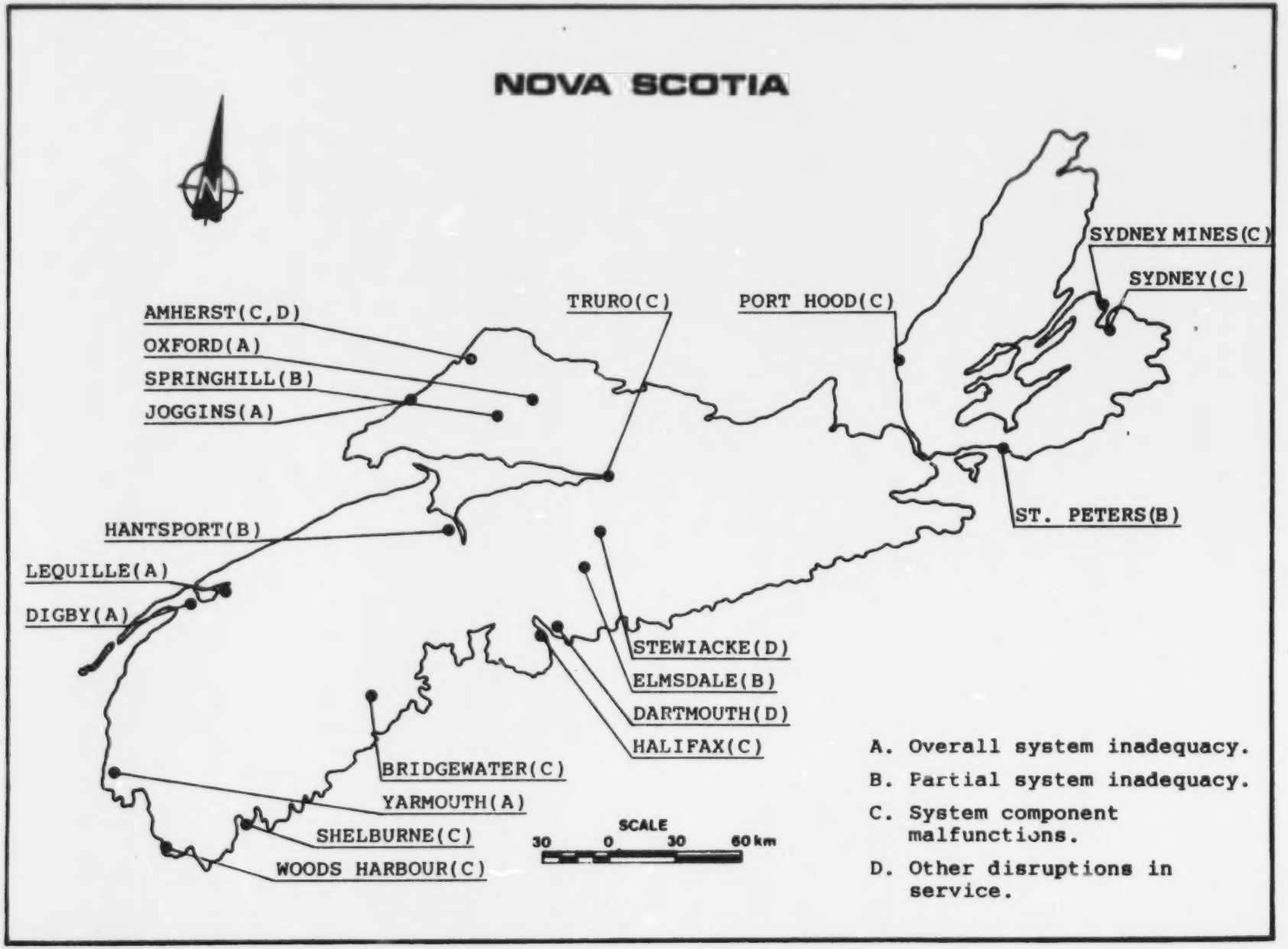

FIG. 2 SUMMARY OF WATER SEWER PROBLEMS

2.3 Water-Sewer Capital Projects

In terms of cost and scale, the $52 million Annapolis River Tidal Power Project dwarfed all other projects taking place in Nova Scotia during the survey period. However, there was evidence in the media coverage (70 articles) of other significant programs providing funds for inland water-related undertakings. In early 1979, the premier announced that an 80% federal-provincial financing package was available to municipalities for the installation and repair of sewage systems (#354), and the Federal Minister of Environment indicated that some of the $150 million allocated to the Central Mortgage and Housing Commission would be used for sewage treatment facilities in the province (#353). However, there was evidence in the clipping information of only one community, Yarmouth, receiving funds under the former program, and only one project in Digby was specifically ascribed to CMHC. Nevertheless, these represent possible sources of financing where funding information was unavailable in the following table.

Coverage from January, 1982 (#220,#231-244) contained the first references to the Stream Bank Stablization and Protection Program, and indicated that $300,000 was allocated that year for erosion and flood prevention in the province under a 75% provincial - 25% landowner funding arrangement. Later in 1982 (#213), the Provincial Minister of Agriculture announced a $15 million land improvement and development program for commercial farmers that applied, in part, to drainage problems. And in June, 1984, the Deputy Prime Minister announced that $2.3 million had been awarded through the Environment 2000 Program, which created 570 jobs devoted primarily to river clean-ups and stream restoration (#372).

The coverage indicated that the financial contribution of municipalities to water-sewer improvement projects was substantial in some cases. The most often seen method of raising the necessary funds was increasing the municipal water rate, as in Yarmouth and New Glasgow, although the sale of debentures was the vehicle used in two communities (#384, Port Hawkesbury and #387, Glace Bay).

The Capital projects were organized by Census District where possible in Table No. 2. Regional and waterway projects crossing district lines were placed at the end of the table. It should be noted that clipping dates in Table No. 2 do not necessarily reflect the timing of all projects, as some items described projects which took place in the past. A Census district figure is included.

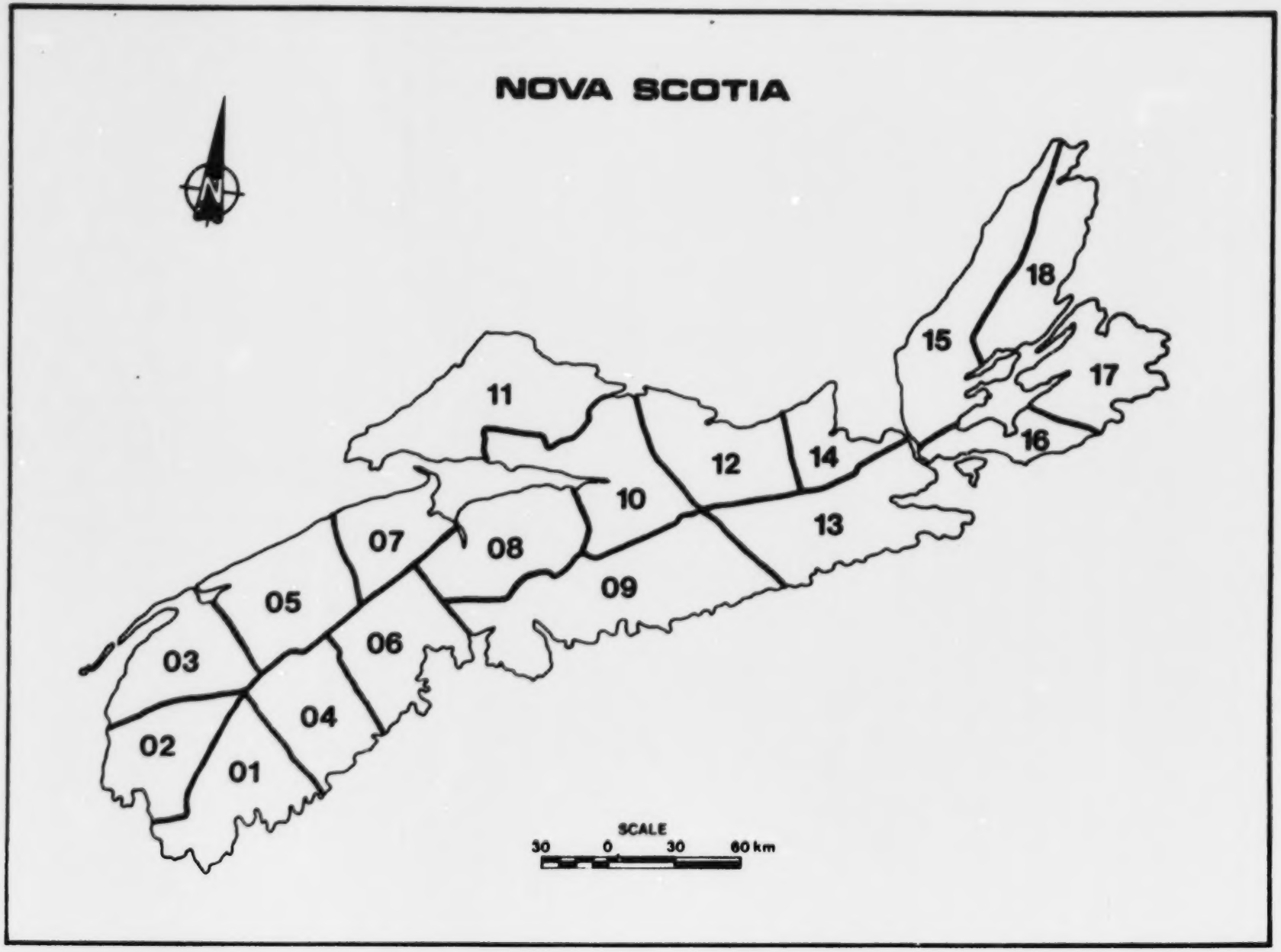

FIG. 3 CENSUS DISTRICTS OF NOVA SCOTIA

TABLE NO. 2

2.3.A. FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S)
01	SHELBURNE	528	23/07/80	PHASE I OF WATER-SYSTEM CONSTRUCTION	$1,630,000	PROVINCIAL GRANT
02	CAPE FORCHU	245	27/04/84	BREAKWATER CONSTRUCTION	500,000	TRANSPORT CANADA
	PORT MAITLAND	544	28/07/82	NEW SEWAGE SYSTEM	712,000	600,000-PROVINCE 112,000 COUNTY OF YARMOUTH
	YARMOUTH	542	08/02/82	CONSTRUCTION OF A NEW WATER SUPPLY AND DELIVERY SYSTEM	6,400,000	5,000,000-PROVINCE REMAINDER - TOWN OF YARMOUTH
03	DIGBY	520	06/12/82	CONSTRUCTION OF A DAM AND PIPELINE	70,522	CMHC COMMUNITY DEVELOPMENT PROGRAM
04	NO RECORDED PROJECTS	-	-	-	-	-
05	LAWRENCETOWN	231	13/08/80	15,000 ACRE DRAINAGE DITCH WITH 25 MILES OF DRAINAGE CHANNELS	NOT AVAILABLE	NOT AVAILABLE

cont'd

TABLE NO. 2

2.3.A FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S)
06	LUNENBURG	522	30/12/81	WATERSHED MANAGEMENT STUDY	$ 9,750	COUNTY OF LUNENBURG
	MAHONE BAY	523	07/05/80	CONSTRUCTION OF AN AQUATIC GARDEN	NOT AVAILABLE	TOWN PARKS COMMISSION
07	KENTVILLE	504, 505	21/02/79, 15/04/80	CONSTRUCTION OF A REGIONAL SEWER SYSTEM	3,000,000	NOT AVAILABLE
08	HANTS	460	22/06/83	ACQUISITION OF A WATER TREATMENT PLANT	9,000	COUNTY OF EAST HANTS
09	BEDFORD (ELMSDALE SUBDIVISION)	459	21/01/84	NEW WATER TREATMENT PLANT	46,000	33,000-COUNTY OF HALIFAX GRANT 13,000-COUNTY OF HALIFAX LOAN
	DARTMOUTH	290	20/12/83	EMISSION CONTROL SYSTEM FOR THE TUFTS COVE POWER PLANT	400,000	N.S. POWER CORPORATION
	HERRING COVE	43	31/08/84	CONSTRUCTION OF A SEWAGE OVERFLOW RETENTION TANK	1,500,000	CITY OF HALIFAX
	NORTH PRESTON	349	16/07/84	BEACH RESTORATION	22,000	FEDERAL ENVIRONMENT 2000 PROGRAM

cont'd

TABLE NO. 2

2.3.A FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S
09 (cont'd)	SACKVILLE	452	11/09/84	WATER DISTRIBUTION SYSTEM EXTENSIONS	$ 400,000	NOT AVAILABLE
	SHEET HARBOUR	373	13/07/84	BEACH RESTORATION	26,000	FEDERAL ENVIRONMENT 2000 PROGRAM
	TIMBERLEA	45	06/10/84	WATER POLLUTION CONTROL PLANT	6,000,000	NOT AVAILABLE
10	BASS RIVER	228	16/02/83	EROSION CONTROL STUDY	119,000	NOT AVAILABLE
	BIBLE HILL	481	22/03/83	SEWER SYSTEM STUDY	50,000	NOT AVAILABLE
	TRURO	466	07/05/80	NEW WATER STORAGE TANK	NOT AVAILABLE	TOWN OF TRURO
	TRURO	477	08/12/8[illegible]	WATER SYSTEM IMPROVEMENTS, WATERSHED ANNEXATION	315,000	TOWN OF TRURO
	TRURO	488	22/02/84	WATERSHED MANAGEMENT STUDY	40,000	50%-PROVINCE 50%-TOWN

cont'd

TABLE NO. 2

2.3.A. FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S)
11	AMHERST	436	14/07/83	CLEANING OF TOWN'S WATER LINES	$ 33,210	TOWN OF AMHERST
	JOGGINS	434	FEBRUARY, 1981 (DAY NOT AVAILABLE)	CONSTRUCTION OF SEWER SYSTEM AND TREATMENT PLANT	NOT AVAILABLE	DEPARTMENT MUNICIPAL AFFAIRS GRANT
	PARRSBORO	440	05/05/81	NEW WELL SYSTEM	450,000	NOT AVAILABLE
12	PICTOU	425	23/02/79	WATER SYSTEM STUDY	60,000	4,800-TOWN REMAINDER-PROVINCE
	STELLARTON	427, 428, 429	25/06/80 29/08/80 08/12/80	MAJOR WATER SYSTEM ADDITIONS AND RENOVATIONS	1,400,000	400,000-PROVINCIAL GRANT REMAINDER UNSPECIFIED
13	MULGRAVE	423	09/12/83	WATER SYSTEM IMPROVEMENTS	200,000	62,000-TOWN REMAINDER UNSPECIFIED
14	ANTIGONISH	424	10/12/80	NEW WATER SUPPLY SYSTEM	4,500,000	NOT AVAILABLE
15	NO RECORDED PROJECTS	-	-	-	-	-

cont'd

TABLE NO. 2

2.3.A. FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S)
16	ST. PETERS	348	18/10/83	CANAL REPAIRS	$ 293,330	FEDERAL DEPARTMENT OF ENVIRONMENT
17	DONKIN AND RESERVE	421	05/09/84	WATER SYSTEM IMPROVEMENTS	255,000	CANADA WORKS PROGRAM GRANT
	GLACE BAY	407, 408	27/03/80, 01/04/83	BROOK CLEAN-UP, WATER-SEWER EXTENSIONS, NEW MUNICIPAL DUMP	4,290,000	1,500,000 - FEDERAL NEED PROGRAM 1,500,000 - MUNICIPAL DEBENTURES 990,000 - PROVINCE 300,000 - NIP PROGRAM
	LITTLE POND	414, 415	04/04/84 (BOTH ARTICLES)	WATER SYSTEM IMPROVEMENTS	120,000	FEDERAL GOVERNMENT
	PORK HAWKESBURY	384	15/01/83	WATER-SEWER MAINTENANCE	NOT AVAILABLE	MUNICIPAL DEBENTURES
	SYDNEY	406	21/02/79	PHASE I OF MUGGAH CREEK CLEAN-UP	300,000	PROVINCIAL DEPARTMENT OF ENVIRONMENT
	SYDNEY	273, 275	29/04/82, 07/10/83	PILOT CARBOGEL PLANT	2,000,000	FEDERAL DEPARTMENT OF ENERGY, MINES AND RESOURCES

cont'd

TABLE NO. 2

2.3.A. FUNDED CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S
17 (cont'd)	SYDNEY MINES	272, 274, 276	16/10/82, 13/04/83, 13/01/84	COAL RECLAMATION PROJECT	NOT AVAILABLE	NATIONAL RESEARCH COUNCIL
	WESTMOUNT	417	07/10/83	WATER SYSTEM IMPROVEMENTS	256,320	FEDERAL NEED PROGRAM
18	NO RECORDED PROJECTS	-	-	-	-	-

TABLE NO. 2

2.3.A. FUNDED REGIONAL CAPITAL PROJECTS

CENSUS DISTRICT	LOCATION	CLIPPING NUMBER(S)	CLIPPING DATE(S)	COMMENT	COST	FUNDING SOURCE(S)
05	ANNAPOLIS RIVER	314	23/06/83	TIDAL POWER PROJECT	$ 52,000,000	25,000,000-FEDERAL GRANT 27,000,000-TIDAL POWER CORPORATION
05	ANNAPOLIS AND NICTAUX RIVERS	12	25/06/83	RIVER RESTORATION AND SALMON RE-STOCKING	71,168	FEDERAL ENVIRONMENT 2000 PROGRAM GRANT
07	GASPEREAU RIVER	64	11/08/82	RIVER CLEAN-UP	NOT AVAILABLE	NOT AVAILABLE
07	KINGS COUNTY	219	16/11/83	PILOT DRAINAGE PROJECT	26,000	FEDERAL DEPARTMENT OF AGRICULTURE
08, 09	SHUBENACADIE CANAL	339	15/06/84	CANAL RESTORATION	5,000,000	4,000,000-FEDERAL 1,000,000-PROVINCIAL
17	CAPE BRETON COUNTY	16	13/06/84	CLEAN-UP OF COUNTY RIVERS	NOT AVAILABLE	PROVINCIAL DEPARTMENT OF ENVIRONMENT

2.3.B. Proposed Projects Seeking Funding

In seven articles, the need for a particular water-related project was stated, but funding arrangements were unsettled at the time of the article and no follow-up information was available. Their treatment here, like the coverage they received, is brief.

- Glace Bay sought federal assistance to combat a waterfront erosion problem which it blamed on dredging work carried out during wharf construction several years previously (#223, 246, October 2, 1984).

- The Medway area applied for a $40,000 Environment 2000 grant for a liming project to combat acidification in the Medway river system (#293, April 19, 1984).

- Milton requested to be hooked into the Queen's County sewer system. The county council indicated that a cost study should be carried out before any action was taken (#527, November 11, 1981).

- Shelburne sought federal aid for new water pumping and treatment facilities. The town's water utility had been operating at a deficit since taking over the system from the province in 1981. As seen in Section 2.3.A., Census District 01, Shelburne received substantial funding in 1980; however the above aid was requested in 1984 (#530, March 26, 1984).

- Sydney was proposed as the site of a bale landfill system to solve Cape Breton County's waste disposal problems. County officials approached the provincial Department of Environment for funding, but the outcome was unclear (#394, August 1, 1981).

- Truro sought provincial funding for a landfill site and associated seepage monitoring devices. (#396, May 11, 1983).

2.4 Water Rates

There was clear evidence in the 21 articles on this subject of a trend toward substantially increased municipal water rates in Nova Scotia during the survey period. Of the 16 communities included in the coverage, only one anticipated a drop in rates, and 7 either sought or were granted increases of 50% or more. The reason most commonly given for these rises was the cost of new installations and/or system improvements. And in Tatamagouche, high rates associated with the installation and maintenance of a new water system prompted a decision by many residents to remain on individual water supplies, resulting in further increases due to a smaller than expected revenue base. (A similar decision was made by Lequille residents. See Section 2.2.A.) A drop in user demand, debt servicing, and an error in spending were other causes of rising water rates.

The following table summarizes municipal water rate coverage for the survey period. There was insufficient information to relate individual increases to specific

capital projects. However, it might be useful to refer to Section 2.3.A. (Funded Capital Projects) in the cases of Antigonish, Glace Bay, Kentville, Parrsboro, Stellarton, Truro and Yarmouth.

TABLE NO. 3

MUNICIPAL WATER RATES

LOCATION	YEAR AND CLIPPING NO.(S)	INCREASE (+) OR DECREASE (-)	SOUGHT-(S) OR APPROVED-(A)	COMMENTS
ANNAPOLIS ROYAL	1982 #513	+ (unspecified)	S	MUNICIPAL SHARE OF A WATER SYSTEM INSTALLED AT AN UNSPECIFIED DATE IN THE PAST, PURIFICATION COSTS
ANTIGONISH	1983 #389	+ 27%	A	UNAVAILABLE
BRIDGETOWN	1983 #385	+ 30%	S	DROP IN WATER CONSUMPTION BY A LOCAL DISTILLERY
GLACE BAY	1982 #387	+ 10%	A	TO SERVICE DEBT
	1983 #387	+ 5%	S	TO SERVICE DEBT
KENTVILLE	1984 #390	+ 10%	S	RECOMMENDATION OF A MUNICIPAL WATER SYSTEM STUDY
LOUISBOURG	1984 #418	+ 14%	S	EXTENSION OF SERVICES FOR A NEW FISH PLANT
MULGRAVE	1983 #422	- (UNSPECIFIED)	ANTICIPATED	DRAMATIC INCREASE IN WATER USE BY PETRO-CANADA OFFSHORE SERVICE VESSELS

cont'd

TABLE NO. 3

MUNICIPAL WATER RATES

LOCATION	YEAR AND CLIPPING NO.(S)	INCREASE (+) OR DECREASE (-)	SOUGHT-(S) OR APPROVED-(A)	COMMENTS
NEW GLASGOW	1982 #381	+ 75%	S	WATER-SYSTEM EXTENSIONS AND IMPROVEMENTS
PARRSBORO	1983 #383	+ 56%	S	REVENUE SHORTAGE DUE TO AN ERROR IN SPENDING
	1984 #383	+ 14%	S	AS ABOVE
PICTOU	1984 #388	+ 50%	S	WATER SYSTEM IMPROVEMENTS
STELLARTON	1981 #429	+ 11%	S	WATER SYSTEM IMPROVEMENTS
SYDNEY MINES	1980 #378	+ 10.3%	S	WATER SYSTEM IMPROVEMENTS
SYDNEY MINES	1984 #379	+ 50%	A	INSTALLATION OF FIRE HYDRANTS AND OTHER IMPROVEMENTS
TATAMAGOUCHE	1981 #380	+ 50%	S	MANY RESIDENTS CHOOSING NOT TO HOOK UP TO WATER SYSTEM DUE TO HIGH RATES
TRENTON	1982 #382	+ 60%	S	UNSPECIFIED INCREASED OPERATING EXPENDITURES
TRURO	1979 #465	- (UNSPECIFIED)	A	UNAVAILABLE
TRURO	1981 #468	37%	A	UNAVAILABLE
YARMOUTH	1979 #540	+ 65%	A	WATER SYSTEM IMPROVEMENTS
YARMOUTH	1984 #391	+ 11.3%	S	MUNICIPAL SHARE OR NEW WATER SYSTEM

3. INLAND WATER CONTAMINATION

The substantial coverage accorded this issue (66 articles) contained evidence of 32 cases of various types of contamination posing a potential or actual threat to municipal, residential, and/or recreational water supplies in 23 communities, one lake, and one rural area. These cases will be detailed in Section 3.2, where they are grouped under the following types: (1) gas-oil leaks and spills; (2) chemical contamination; (3) bacterial contamination; (4) natural contamination; (5) sewage and leachate contamination; and (6) unidentified contamination. A table for each type and a summary figure is included.

3.1 Policy Development

In the Provincial Minister of Environment's 1981 year end statement (#4), acid rain, waste disposal and uranium exploration were stressed as the prominent environmental issues in Nova Scotia (acid rain and mining will be discussed in later sections). And in September, 1983, the Head of the Hazardous Waste Section of Halifax's Environment Canada office indicated in an address to the Community Planning Association that 90% of the province's hazardous waste was generated by the petro-chemical and pulp and paper industries, with householders being responsible for 10% of the 1981 total of between 50,000 and 60,000 tons (#398).

The province's approach to these problems, as stated by the N.S. Minister of Environment in early 1979, was one of "quiet, steady progress in protecting our environment and managing the province's water resources" (#3). Federally, the Minister of Environment indicated in October 1982 that the use of regulations would decrease in favor of a "watchdog approach" in dealing with

pollutants and polluters, with the accent on prevention (#5). The coverage contained insufficient information to properly assess the results of the above policies. In the only article of possible use in this regard (#55), it was revealed that the Canadian Wildlife Service was re-introducing the peregrine falcon, extinct in the province since 1955 due to widespread pesticide use, into the Bay of Fundy area in August 1984 after research indicated the environment had improved sufficiently to enable its survival.

Among the concrete steps taken by government to protect the province's water resources was raising the maximum penalty for non-compliance with pollution control guidelines from $5000 a day in 1977 to $100,000 a day in 1979 (#1). The Chief of Water Pollution Control for the Environmental Protection Service said in January, 1979 that Nova Scotia had "a fairly good record" regarding compliance, but warned that poor economic conditions posed a threat to industry's ability to meet pollution control goals since tax incentives only partially relieved the financial burden associated with instituting these controls (#1).

3.2 Specific Contamination Types

3.2.A. Gas-Oil Leaks And Spills

Although the N. S. Minister of Environment stated that over 100 oil spills occurred in 1981 alone (#4), the coverage contained information on only seven cases for the entire survey period. Of these cases, three were caused by tanker or train accidents which appeared to cause minimal damage and were promptly cleaned up. However, a leaking underground storage tank caused an explosion in

Amherst and a ruptured tank necessitated the evacuation of a two block area in Windsor. Fear of water supply contamination was stated in four of the seven cases.

TABLE NO. 4

INLAND WATER CONTAMINATION

TYPE: GAS-OIL LEAKS AND SPILLS

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
AMHERST	18/07/84	18, 71	UNDERGROUND LEAKING STORAGE TANKS	REFERENCE TO 5 CASES WITHIN THE PREVIOUS YEAR, ONE CAUSING AN EXPLOSION. "BECOMING AN INCREASING PROBLEM IN THE COMMUNITY" - TOWN COUNCILLOR (#18). FEAR OF LEAK'S EFFECTS ON TOWN WATER SUPPLY STATED. (#18)
MIDDLETON	29/12/82	65	TANKER ACCIDENT	N.S. ENVIRONMENT DEPARTMENT OFFICIALS CALLED IN, BUT SPILL APPARENTLY A MINOR ONE.
PICTOU	08/12/82	426	NONE STATED OR SUGGESTED	HYDROGEN SULPHIDE GAS WAS LEAKING INTO WATER SYSTEM OF A SENIOR CITIZEN'S COMPLEX. NO FURTHER INFORMATION.
POINT TUPPER	03/02/81	56	FROZEN FUEL LINE AT LOCAL MILL	45,000 LITRES OF GAS SPILLED. N. S. DEPARTMENT OF ENVIRONMENT OFFICIAL INDICATED DAMAGE WAS MINIMAL AND CLEAN-UP WOULD BE COMPLETED IN 2-3 DAYS.
QUEENSLAND	12/06/82	63	TRAIN DERAILMENT	SPILL OF 10,000 GALLONS OF NAPTHA GAS. FEAR OF GROUND WATER CONTAMINATION. INDICATIONS THAT AREA WELLS WERE TO BE TESTED.
TRURO	14/05/84	489	TANKER ACCIDENT	CONCERN EXPRESSED ABOUT OIL REACHING WATER SUPPLY, BUT CLEAN-UP ACCOMPLISHED BY MUNICIPAL WORKERS IN ONE DAY.
WINDSOR	24/02/79	46	RUPTURED UNDERGROUND STORAGE TANK	TWO BLOCK AREA EVACUATED WHEN ENVIRONMENT DEPARTMENT OFFICIALS RECORDED A 90% GASOLINE READING IN THE SEWAGE SYSTEM. 1500 GALLONS OF GASOLINE WERE FLUSHED BEFORE RESIDENTS COULD RETURN.

3.2.B. Chemical Contamination

With only five examples recorded in the clipping information, this type of contamination would not appear to be a major problem in Nova Scotia at this time. However, the dilemma faced by Amherst and Truro when water supplies in the two communities were found to be contaminated with the toxic chemical tetrachloroethylene deserves noting. With no Canadian recommended safe levels for this chemical, provincial and municipal officials looked to U.S. and World Health Organization standards. However, U.S. safe levels were considerably above those of the W.H.O., and experience with tetrachloroethylene was so limited as to prevent a reasonable assessment of either figure (#437). Unfortunately, except for references to "the situation being monitored", there was no follow-up information on these cases.

TABLE NO. 4.1

INLAND WATER CONTAMINATION

TYPE: CHEMICAL

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
AMHERST	10/09/83 28/09/83	437, 438	NOT ESTABLISHED. LOCAL DRY CLEANING INDUSTRY SUSPECTED SOURCE	TOXIC CHEMICALS TETRACHLOROETHYLENE AND TRICHLOROETHANE TURNED UP IN A MUNICIPAL WELL AT LEVELS OF 60-80 PARTS PER MILLION (WORLD HEALTH ORGANIZATION SAFE LEVELS: 10 PARTS PER BILLION). PROVINCIAL DEPARTMENT OF HEALTH & ENVIRONMENT CALLED IN. NOTHING FURTHER. SEE TRURO BELOW.
DOMINION	05/07/84	17	SPILL AT LOCAL RAILWAY FREIGHT SHED	VERY BRIEF ITEM ABOUT A "TOXIC CHEMICAL SPILL" CLEANED UP BY THE TOWN FIRE DEPARTMENT.
GUYSBOROUGH	07/12/81 11/12/81	61, 62	FAULTY TRANSFORMER	SMALL AMOUNT OF PCB'S SPILLED ON N.S. POWER CORPORATION LAND. INDICATIONS THAT ENVIRONMENTAL TESTS WOULD BE CARRIED OUT.
PORT HAWKESBURY	16/02/84	412	LEAK IN A CHEMICAL RECOVERY BOILER AT A LOCAL MILL	LEAK REPAIRED WITHOUT INCIDENT, ALTHOUGH THE SITUATION "COULD HAVE BEEN SERIOUS IF WATER HAD MIXED WITH CHEMICALS INSIDE THE HOT BOILER DURING THE PULP MAKING PROCESS."
TRURO	08/02/84 21/02/84	486, 487	AS IN AMHERST, ABOVE	TOXIC CHEMICAL TETRACHLOROETHYLENE TURNED UP IN A MUNICIPAL WELL AT LEVELS OF 40-50 PARTS PER BILLION. N.S. DEPT. OF ENVIRONMENT CALLED IN. NO FURTHER INFORMATION.

3.2.C. Bacterial Contamination

Of the five cases concerned with bacterial contamination, four involved coliform bacteria. In three incidents, the bacteria entered water supplies following rain storms, and storm run-off was named as the agent of introduction. The necessity of boiling water and the closing of swimming areas were the common results of this contamination

TABLE NO. 4.2

INLAND WATER CONTAMINATION

TYPE: BACTERIAL

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
DARTMOUTH	05/09/84	72	NOT ESTABLISHED. WATER FOWL FEEDING ON AQUATIC SNAILS, HOST OF THE SCHISTOSOMALIDA PARASITE, SUSPECTED AS THE CAUSE	SWIMMING AREAS IN DARTMOUTH WERE CLOSED DUE TO PERSISTANT SWIMMER'S ITCH PROBLEM. NO FURTHER INFORMATION.
HALIFAX	17/07/81	59	NONE STATED OR SUGGESTED	TWO HALIFAX LAKES CLOSED TO RECREATIONAL ACTIVITIES
NEW GLASGOW	31/07/84	15	NOT ESTABLISHED. STORM RUN-OFF CONTAINING MANURE, AND UNTREATED RAW SEWAGE FROM UNIDENTIFIED SOURCES SUGGESTED AS CAUSES	"UNACCEPTABLE" LEVELS OF FECAL COLIFORM BACTERIA FOUND IN THE EAST RIVER NEAR NEW GLASGOW. NO FURTHER INFORMATION.
PRIESTVILLE	25/09/80	35	NOT ESTABLISHED. STORM RUN-OFF AND RAW SEWAGE SUGGESTED AS POSSIBLE CAUSES	HIGH COUNTS (15 TO 1000 PER 100 MILLILITRES OF WATER) OF FECAL COLIFORM BACTERIA DISCOVERED IN AREA WELLS. NO FURTHER INFORMATION.
TRURO	20/08/84	499	STORM RUN-OFF	RESIDENTS FORCED TO BOIL WATER DUE TO HIGH COLIFORM BACTERIA COUNTS IN THE TOWN'S RESERVOIR.

3.2.D. Natural Contamination

Coverage on this subject indicated that diverse areas of the province were suffering from water supplies contaminated with arsenic and uranium. In May 1980, unnamed environmental scientists pointed out that arsenic contamination was not restricted to gold mining areas in the province, where this type of contamination could be expected, and suggested the problem would be worse were it not for the high acid and iron content of Nova Scotia waters (#21). In December 1980, the provincial government created a Uranium Task Force which reported in April 1981 that, except for Harrietsfield, water supplies in the province met water quality guidelines, which were unspecified in the article (#23). However, in September 1984, Provincial Department of Health officials, appearing before the Federal Water Policy Inquiry, indicated that 25% of the samples analyzed by the department exceeded the maximum safe level, and recommended raising the "ultra-conservative" uranium level then in use.(#33)

In two of the five cases contained in tne clipping information, communities had to rely on trucked-in water for several years while solutions were being considered, and in another case, arsenic contamination was linked to serious medical problems (#28). Several communities expressed concern about the potential long term health hazards associated with drinking the contaminated water for years prior to discovery of the contamination. Since local geology was often the cause, solutions were not readily

evident. One potential solution was a new filtering device developed by an official of the N.S. Research Foundation introduced in 1982. However, the coverage contained no follow-up information on the filter's effectiveness in actual use.

TABLE NO. 4.3

INLAND WATER CONTAMINATION

TYPE: NATURAL

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
ADVOCATE	17/02/79	19	LOCAL GEOLOGY	"HIGH QUANTITIES" OF METALLIC ARSENIC WERE FOUND IN THE COMMUNITY'S WATER SYSTEM. NOT LETHAL, BUT ABOVE RECOMMENDED LEVELS. WATER QUALITY STUDY TO BE CARRIED OUT.
CHARLOS COVE	21/01/83 26/01/83 29/01/83	27, 28, 29	NONE STATED OR SUGGESTED	WATER SAMPLES FROM A RESIDENTIAL WELL INDICATED ARSENIC LEVELS OVER DOUBLE THOSE CONSIDERED "SAFE". ARTICLE STATED THE AFFECTED FAMILY HAD A HISTORY OF MEDICAL PROBLEMS, INCLUDING CANCER.
HARRIETSFIELD	05/06/81 29/06/84	24, 32	LOCAL GEOLOGY	TESTS CONDUCTED BY PUBLIC HEALTH OFFICIALS IN 1981 REVEALED 58 COMMUNITY WELLS EXCEEDED FEDERAL SAFETY MEASURES FOR URANIUM, AND 40 MORE HAD BOODERLINE READINGS. WATER STILL BEING TRUCKED IN THREE YEARS LATER, WITH NO SOLUTION IN SIGHT.
NEW ROSS	12/02/82	31	NONE STATED OR SUGGESTED	6 OF 17 WELLS TESTED IN THE AREA WERE FOUND TO HAVE "UNACCEPTABLE" LEVELS OF URANIUM. NO FURTHER INFORMATION.
WAVERLEY	12/02/80 11/09/82	20, 26	NONE STATED OR SUGGESTED	THE ARTICLES INDICATED RESIDENTS HAD BEEN USING UNSPECIFIED TEMPORARY WATER SUPPLIES SINCE ARSENIC WAS FOUND IN WELL WATER SIX YEARS PREVIOUSLY. WORK WAS BEING DONE ON AN ALTERNATIVE WATER SUPPLY.

3.2.E Sewage And Leachate Contamination

Landfill sites were the source of leachate contamination in half of the six cases discussed here. These sites were obviously perceived as a problem, as in October 1983 the Hazardous Waste Section of Environment Canada announced the launching of a Federal-Provincial study of old and abandoned landfill sites in the province to determine their effect on local ground water (#400). The only article which contained a possible solution to the leachate problem concerned the experimental use of a newly developed system of anaerobic filters to pre-treat leachate at the Halifax Metropolitan Authority's regional landfill site in Middle Sackville in May, 1984. (#405).

Fear of the health consequences of using leachate contaminated water was evident in two cases (Truro, Gold River). And this type of contamination forced Kings County to purchase several affected properties in Kentville and consider moving its landfill operation to a more remote location.

TABLE NO. 4.4

INLAND WATER CONTAMINATION

TYPE: SEWAGE AND LEACHATE

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
AYLESFORD LAKE	06/02/82	392	INADEQUATE SEWAGE DISPOSAL SYSTEMS OF LOCAL COTTAGES	THE LAKE WAS BEING POLLUTED BY SEWAGE FROM SURROUNDING COTTAGES. SMALL LOT SIZES PREVENTED THE INSTALLATION OF PROPER SEWAGE DISPOSAL SYSTEMS.
GOLD RIVER	11/02/83 26/05/83	395, 396	DUMP SITE	RESIDENTS CONCERNED ABOUT POTENTIAL DISEASE AND WATER POLLUTION FROM RODENTS AND LEACHATE. DEPARTMENT OF HEALTH ORDERED THE DUMP SITE CLEANED UP.
KENTVILLE	16/11/83 01/02/84 24/07/84	401, 402, 403	COUNTY LANDFILL SITE	LEACHATE CONTAMINATED THE DRINKING WATER OF SEVERAL RESIDENCES. COUNTY PURCHASED SOME OF THE AFFECTED PROPERTIES AND WAS CONSIDERING MOVING THE LANDFILL OPERATION.
PICTOU	17/03/82	393	EAST RIVER POLLUTION ABATEMENT PLANT	SLUDGE FROM THE PLANT WAS BEING DUMPED ON A FARM IN THE COUNTY. ENVIRONMENT CANADA OFFICIALS WERE "ASSESSING THE SITUATION".
TRURO	15/10/83	399	LANDFILL SITE	LEACHATE CONTAINING HIGH LEVELS OF BACTERIA, MAGNESIUM, AND ARSENIC WAS CONTAMINATING A LOCAL BROOK FLOWING THROUGH AN INDIAN RESERVE. DEPARTMENT OF HEALTH OFFICAILS WERE MONITORING THE SITUATION.
WOODS HARBOUR	22/10/82	532	UNSPECIFIED "SEWAGE SYSTEMS".	RESIDENTIAL WELLS WERE BEING CONTAMINATED WITH SEWAGE. OWNERS DUG DEEPER, BUT CONTAMINATION CONTINUED. COUNTY BOARD OF HEALTH INDICATED IT WOULD INVESTIGATE.

3.2.F. Unidentified Contamination

The three cases discussed here involve large amounts of dead fish turning up along waterways for unknown reasons. These incidents would seemingly be illustrative of the sensitivity of inland water fish to changes in the aquatic environment, but this subject was not discussed in any of the clippings.

TABLE NO. 4.5

INLAND WATER CONTAMINATION

TYPE: UNIDENTIFIED

LOCATION	DATE(S)	CLIPPING NO.(S)	SOURCE	COMMENT
NEW GLASGOW	26/02/80 08/03/80	350, 351	NOT ESTABLISHED. N.S. POWER CORPORATION GENERATING PLANT SUSPECTED AS THE SOURCE	OVER 1000 DEAD FISH WERE FOUND ALONG THE EAST RIVER NEAR THE PLANT. EPS OFFICIALS REQUESTED N.S.P.C. TO STOP DUMPING SULPHURIC ACID IN THE RIVER, THOUGH THE OFFICAL CAUSE REMAINDED UNKNOWN.
NORTH RIVER	23/07/80	34	NONE STATED OR SUGGESTED	OVER 1000 DEAD FISH AND EELS FOUND ALONG THE RIVER. EPS SUGGESTED HIGH TEMPERATURES, LIGHTNING OR UNSPECIFIED CONTAMINATION AS POSSIBLE CAUSES.
TRURO	31/05/84 15/06/84 05/07/84 06/09/84	494, 495, 496, 503	NOT ESTABLISHED. NEARBY INDUSTRIAL PARK SUGGESTED AS A POSSIBLE SOURCE	DEAD FISH WERE FOUND IN A TOWN BROOK FOR THE FOURTH TIME IN TWO YEARS. PROVINCIAL DEPARTMENT OF ENVIRONMENT OFFICIALS SUGGEST "INAPPROPRIATE" SEWAGE DISPOSAL PRACTICES AT A NEARBY INDUSTRIAL PARK "MAY HAVE CONTRIBUTED" TO THE FISH KILL.

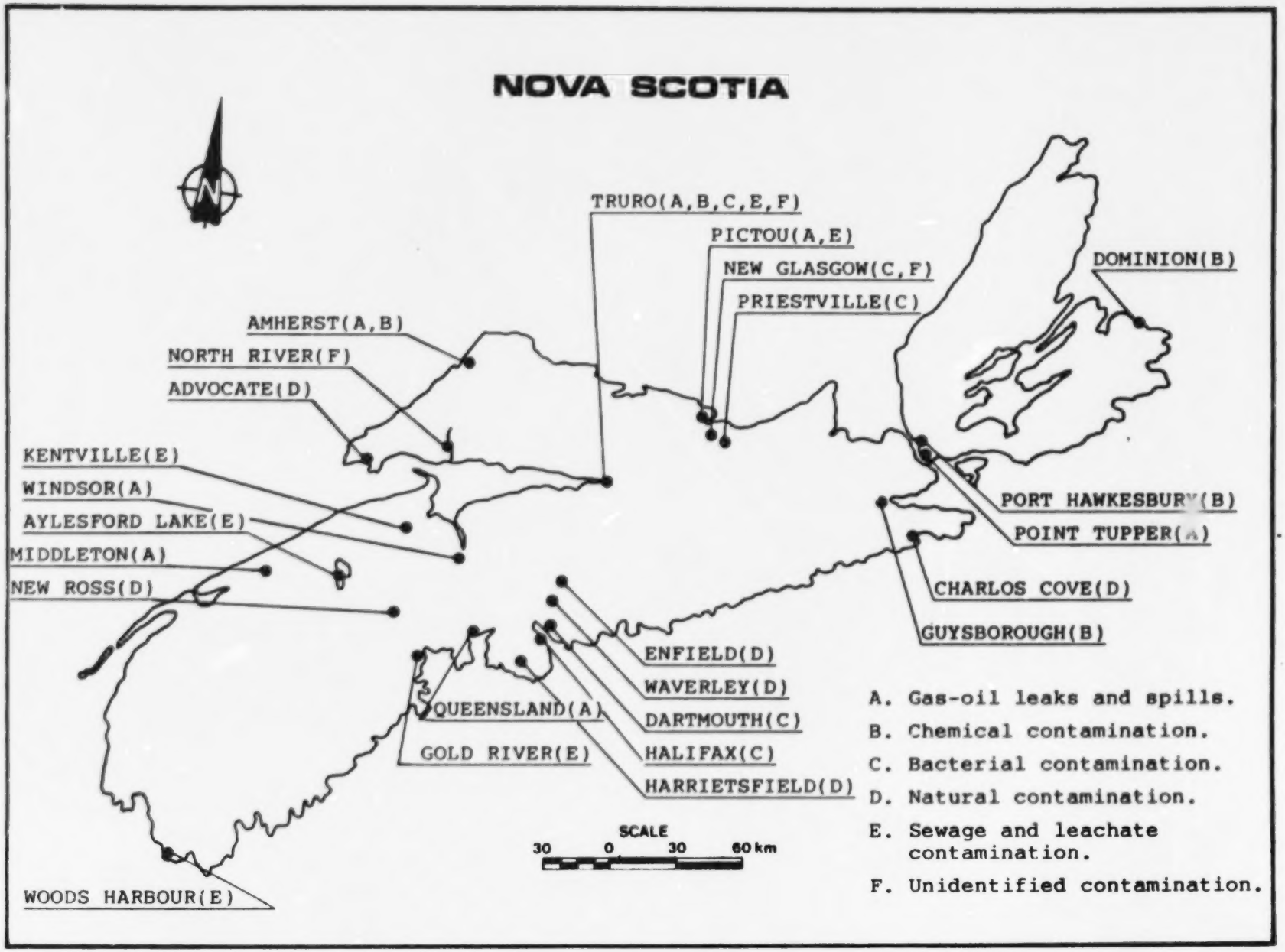

FIG. 4 INLAND WATER CONTAMINATION SUMMARY

4. ACID RAIN

With 73 articles in coverage, acid rain was quite clearly a high profile issue in Nova Scotia during the survey period. Of these, 35 items were concerned with the ongoing U.S.-Canada disagreement over acid rain's causes, results and solutions. While this international difference of opinion is no doubt of ultimate relevance to Nova Scotia, the province's interests were not discussed in these items; therefore they will not be dealt with here. Of the remaining 38 articles, the majority were concerned with the effects of acid rain on fisheries, forestry and health, and on efforts to combat the effects of acidification in the province.

Although acid rain was considered a serious problem by most sources included in the coverage, there was some dissent. In early 1983, the N.S. Deputy Minister of the Environment said, in a speech to the Canadian National Energy Forum, that there was "no solid proof" that acid rain caused environmental damage, a statement immediately disputed by Environment Canada officials (#175). Also in early 1983, a report from an unidentified research group indicated that sulphur dioxide emissions in Nova Scotia would not "appreciably hurt us or any outsider." (#177). And an editorial page article from 1984 suggested concern about acid rain was just another environmentalist fad. (#208). While other articles contained disagreements about how to best combat the problem, these were the only three items to question its seriousness.

4.1 Effects of Acid Rain on Fisheries, Forestry, And Health

4.1.A. Fisheries

As early as April, 1980, the N.S. Salmon Association stated that the problems of overfishing, netting and poaching were unimportant compared with acid rain because it was making rivers uninhabitable for fish (#139). The same month, the Canadian and Atlantic Wildlife Federations suggested trout may become an endangered species in the province within five years without government action (#140). And in late 1981, a Department of Fisheries and Oceans official said the province's serious acidification problem was unlikely to improve in the next 20 years, which could be too late for the trout and salmon (#154).

Evidence in the clipping information tended to support the concerns of these groups, as in June 1983, DFO wrote off 10 Nova Scotia rivers as "not being able to sustain salmon due to extreme acidity" (#181). The hardest hit rivers were in the south-western area of the province. In rivers like the Mersey, near Liverpool, acidity levels were naturally high and, with the surrounding soil lacking a buffering capacity, the introduction of additional acid resulted in "this once great salmon river" becoming "lethal to (salmon) stocks." (#144). Other rivers, such as the LaHave, near Lunenburg, appeared able to survive due to their "good drainage basins" and the buffering capability offered by surrounding soil composition (#149). Due to the loss of these rivers, the N.S. Salmon Association urged

DFO in April, 1983 to increase the scheduling of inland waters and initiate a buy back program of commercial salmon licences (#346). And in March, 1984, a Department of External Affairs spokesman stated that if acid rain's negative effects on Nova Scotia's sports fishery continued, the province's tourism industry would be threatened (#207).

4.1.B. Forestry

There were only two brief items concerned with acid rain's effects on forestry. In December, 1983, the Nova Scotia Forestry Association indicated its studies showed that acid rain may inhibit pollination and contribute to the spread of tree disease (#199). The other article quoted unidentified New Brunswick studies as showing "without a doubt that acid rain retards forest growth". (#169)

4.1.C. Health

In June, 1982, a Kentville physician expressed concern that acid rain may be raising the potential toxicity of other organic pollutants prevalent in Nova Scotia waters, and urged investigation of this possibility (#166). And in late 1983, a professor of medicine at Dalhousie University, concerned about the introduction of heavy metals into drinking water and the transmission of carcinogens, said that "the health effects of acid rain must be monitored in Nova Scotia regardless of how difficult this may be." (#195).

4.2 Responsive Measures to Acid Rain

In late 1980, a DFO official stated that one third of Nova Scotia's acid rain was internally generated (#149), and in early 1982, a Nova Scotia Member of Parliament accused the N.S. Power Corporation of being the province's "biggest emission polluter" (#158). To curb these emissions, the Ecology Action Centre, a private environmental group, urged the use of scrubbers in coal burning plants (#172). Not unexpectedly, NSPC objected, denying their plants posed an environmental danger and saying the costs associated with scrubbers would make electricity production uneconomical. Environment Canada officials and other groups stressed the need to curb sulfur emissions and suggested the use of low sulfur coal (#162, 167). And in March, 1984, the federal and Nova Scotia governments reached an agreement to reduce sulfur dioxide emissions by 50% (#203). Other efforts to reduce emissions included experiments with a fluidized bed combustion boiler, in which coal is burned over a bed of limestone (#160), and a pilot carbogel plant in Sydney which used emission reducing additives with coal in its boilers (#273). The most often seen method of attempting to neutralize acidity in water was the dumping of large amounts of limestone in water bodies (#143,154), with mixed results. A 1979 test involving 100 lakes treated with limestone revealed no change in acidity in two thirds of the test sites, a reduction in one quarter, and an increase in the remainder. (#143).

An estimated 70% of Nova Scotia's acid rain was externally generated (D.F.O. figure, #141), with the northeastern U.S. being the leading source. Combined with the federal government's persistent efforts to persuade the U.S. to reduce these emissions, Environment Canada set up a sophisticated Long Range Transport of Air

Pollutants (LRTAP) monitoring station in Kejimkujiak National Park in 1980 to obtain detailed data on the amount and source of the province's acid rain (#143), and in 1983 began issuing weekly acid rain bulletins based on information from this station and four others across Canada. (#197)

5. SPRUCE BUDWORM SPRAY

Although this subject received only ten articles of coverage specifically regarding water impacts, it was evident that this issue was one of considerable controversy in the province during the survey period. The spray program, orginally to have begun in 1982, was halted by several court actions carried out by a group called Citizens Against Pesticides, a coalition of environmentalist interests (#52). The final legal challenge to the spray program, the much publicized herbicide spray trial pitting fifteen Cape Breton landowners against Nova Scotia Forest Industries and the provincial Department of Environment, failed in the summer of 1984 and spraying began that August. The issue was obviously emotionally charged, as the N.S. Wildlife Federation termed the government's willingness to permit herbicide spraying "a betrayal of the democratic process." (#49)

Due to this vehement opposition, the Department of Environment switched from the chemicals (2, 4D) and (2, 4, 5-T) to the less toxic herbicide Round-up (#52). However, this did little to ease fears that drinking water would be contaminated by the spray. Fishermen in Colchester County also were concerned about the spray's effects on Cobequid Bay (#48). Department of Environment officials indicated that spraying would not take place near registered watersheds and wells, but the Department had seemingly not taken into account the large number of rural Nova Scotians who obtained their drinking water from

unregistered sources (#50). There was also evidence of fears that spray guidlines would not be strictly adhered to, since the Department had allegedly failed to prosecute violaters in the past. (#50)

6. ENERGY WATER USE

The clipping information (51 articles) indicated that the proportion of Nova Scotia energy produced from water sources, although still relatively small, increased somewhat during the survey period, primarily due to the experimental Annapolis River Tidal Power Project. The coverage suggested that the results of this project would determine the feasibility of a multi-billion dollar Fundy Tidal Power project that would supply all of Nova Scotia's energy needs and provide additional power for export.

The following examples of energy water use, because they are unrelated, are discussed on a case by case basis,

1. Annapolis River Tidal Power Project, December 5, 1979 to August 21, 1984, #216-218, #303-323. Briefly, this project, located near Annapolis Royal, traps Bay of Fundy high tide water and uses it to power a huge prototype Straflo turbine. The major water-related concerns raised by the project were fears of farmland flooding, disruptions in fish migration, and salt water seepage (217, 307, 308). The Tidal Power Corporation indicated that barriers would be built along the river to prevent flooding (#312), and fishways would prevent disruptions in fish passage (#304). Studies carried out for the project predicted no increase in the salt content of the river (#312). However, the New England states expressed concern that such projects would raise their tides and cause some flooding in low lying areas there. There was

no response to this contention contained in the coverage. The project, expected to produce 20,000 kilowatt hours of electricity (#310), received funding on December 5, 1979 and appeared to be in operation on August 21, 1984. (#316, 317) For funding information, see Section 2.3A, Regional Capital Projects.

2. Medway River Diversion Project, February 25, 1984 to July 24, 1984, #291-302. This two year, $16 million project was under consideration by the Nova Scotia Power Corporation in the last year of the survey, and a final decision had not been made at the survey's conclusion. It involved diverting waters from the Medway River System to the Nictaux River system through the construction of dams and canals to provide enough water for a new power generating plant. County residents, particularly sport fishermen, opposed the project on the grounds that the resulting lower water levels on the Medway River would further deplete already meagre salmon stocks. Earlier plans to divert the waters of the LaHave River for power generation had apparently been scrapped in 1981 for the same reason (#288).

3. Heavy Water Plants, December 12, 1980 to October 22, 1983, #324-331. All of the articles on this subject concerned the fate of the Glace Bay and Port Hawkesbury plants. With an over-supply of unsold inventory and no new foreseeable sales, there were indications that the federal government was considering closing the plants (#330) in early 1983. However, in October of that year, the federal Minister of Energy pledged that the plant operations would continue, despite heavy losses. (#331).

4. Coal Reclamation Project, October 16, 1982 to January 13, 1984, #272, 274, 276. After a decade of studies, the National Research Council set up a plant in Sydney mines

to transform coal waste into good quality low ash coal by fine screening the sludge and mixing the residue with water and a small amount of oil. The project was apparently successful, since a private company announced in early 1984 that it was opening another coal reclamation plant in the same area using the NRC process, which was developed as part of federal programs to reduce reliance on imported oil.

5. Pilot Carbogel Project, April 29, 1982 to October 7, 1983, #273, 275. The Department of Energy, Mines and Resources funded this project to develop a 70% coal, 30% water mixture to use as a fuel for generator plant boilers. With the use of additives, the mixture became a low viscosity storable fuel handled much like oil, and with significantly reduced sulphur dioxide emissions than those resulting from ordinary coal burning. Testing of the carvogel in actual usage began in July, 1983 at a Chatham, New Brunswick generating plant, but "serious problems developed in atomization." (#275) There was no further information on the project. For funding details, see Section 2.3.A., Census District 17.

6. Geothermal Energy Potential, May 21, 1980 to March 1, 1982, #286, 287. There were two articles dealing with the potential of this type of energy in Nova Scotia. One item quoted an unidentified research paper as saying that the province had a sufficiently high average in ground water temperature to operate water-air heat exchange units to heat private homes and other building. Pointing out that this type of energy was renewable, abundant and inexpensive, the second article identified the Cumberland geological basin as the most promising area for exploitation of this potential source of heat.

7. AGRICULTURAL WATER ISSUES

Erosion, and measures to protect farmland from flooding were seen to be the most prominent water-related agricultural issues covered in the clipping information (29 articles), and there was evidence these problems generated a controversy between agricultural interests and the Department of Fisheries and Oceans.

With several sources, including the Senate Committee on Agriculture, Fisheries and Forestry (1984) Report on Soil Erosion (#221, 222, 225) pointing to the build-up of gravel bars in rivers as the primary cause of erosion problems, there were calls in public meetings and newspaper editorials (#221, 224, 237) for the removal of these bars to allow water to run down the middle of water courses rather than erode the banks on either side. However, DFO, whose approval was necessary for any such action, feared the sediment upheaval entailed in the removal of these gravel bars would seriously disturb the fish habitats in the rivers and streams involved (#60). This view was supported by a Provincial Lands and Forests biologist, who associated the removal of gravel bars with the disappearance of larger game fish, such as salmon and trout, from an unspecified number of Nova Scotia river systems (#171). The result was a stand-off which one farmer protested by personally removing a gravel bar he felt was causing the erosion of his land, for which he was fined $1000 (#80). With other farmers complaining about the lack of government action on the problem, the issue appeared to be unresolved at the survey's conclusion.

One form of action the provincial government did take was the initiation of the Stream Bank Stablization and Protection Program, which involved the placing of quarried rock along river banks to protect farms and other lands from the effects of erosion and flooding. The first reference to this program, which involved a 75% provincial - 25% landowner funding

arrangement, appeared in December, 1983 (#220). Subsequent articles on the program indicated it was very popular with farmers, woodlot owners and other landholders (#234, 238, 240, 242, 243, 244, 247).

There were two articles which indicated concern about the effects of the use of chemical fertilizers on health and drinking water quality (#51, 235), one item on a hydroponics experiment at the N.S. Argicultural College in Truro involving the growing of lettuce in water (#214), and one article about the use of the Canada-Nova Scotia Flood Damage Reduction Program to make potential landowners aware of flooding risks before purchasing land (#247).

8. WATER-RELATED MINING ISSUES

Widespread concern about the effects of various mining activities on local drinking and recreational water supplies dominated this area of coverage (23 articles), with uranium exploration and possible future mining causing the most debate.

In October 1981, the N.S. Federation of Agriculture called for a halt to all uranium exploration and mining until its effects on farming were determined (#249). In May, 1982, a group called Canadians Against a Radioactive Environment (C.A.R.E.) expressed concern about the possible contamination of ground water by uranium drilling in the River John area (#251). At the same time, local environmentalists and the N.S. Wildlife Federation called for a ban on uranium exploration on watershed lands (#253, 255). As a result of this concern, the province set up a Uranium Inquiry to accept submissions on the issue from interested parties and to make recommendations. The first reference to this inquiry appeared on May 21, 1982 (#252), and

the final item on February 23, 1983 indicated the inquiry was still proceeding (#257). The coverage contained no information on its recommendations.

Another controversial mining development was the proposal by the Provincial Crown Corporation, Novaco, for a strip mine in Eastern Cape Breton in early 1982. Local opposition to the mine resulted in the proposed site being moved from Sydney to Glace Bay and finally to Gardiner. Lobbying efforts by Sydney municipal officials to halt the development were prompted by fears the mine would result in the pollution of ground water and fishing areas (#266, 267). A later article on the proposed strip mine indicated it was "on the back burner", according to the Premier, until water and environmental studies were completed (#271, October 5, 1982). In the final reference to the matter in late 1984, with the Gardiner site shelved and the mine now proposed for Glace Bay, it was raising the objections of local political candidates there (#281).

In July 1980, residents of New Waterford were upset over plans by the Cape Breton Development Corporation (DEVCO) to set up a tailings pond near the town's watershed area (#259). An article from October, 1983 indicated the project had received approval from the provincial Department of Environment and the town was seeking access to the water quality reports associated with the approval process (#260). The pond appeared to be in operation in June, 1984 (#261), and there were no further references to the subject.

The only other water-related mining articles concerned a mine closure in River Hebert due to flooding in early 1980 (#258, 262), and the Carbogel and Coal Reclamation Projects already discussed in Section 6.

9. FISHERIES

The majority of articles on this subject dealt with the negative impact of acid rain and other forms of contamination on the inland fishery, and with the harmful effects of anti-erosion measures on fish habitats in Nova Scotia rivers. These issues were discussed in Sections 3, 4 and 7 and will not be repeated here.

Aside from the above, there were two articles which described how once popular fishing areas had fallen victim to "careless urbanization" in the Halifax region (#39, 40). The MacKintosh Run, a system of lakes between Halifax and Herring Cove which used to host an annual run of salmon, lost all traces of this popular game fish when siltation "ruined the spawning gravel". And First Lake, near Sackville, was reduced to "a 2.5 kilometer mud bowl" by the construction boom of the early 1970's. When construction activity slowed in the early 1980's, the provincial Department of Fisheries stocked the lake with 8000 book trout and announced that strict environmental controls would be enforced on future developments near the lake.

In addition, there were two articles on hatcheries (#74, 297). One item dealt with DFO's reluctance to provide fish ladders past the fourth dam on the Mersey River, as the local salmon association had been urging, because it would mean opening the fisn hatchery located near the dam to the highly acidic river water. The hatchery had been using an alternative water source. The other article described the loss of 106,000 brook trout in a Yarmouth county fish hatchery due to unusually high temperatures in August, 1984.

Coverage indicating public awareness of the importance of the inland fishery was very limited, but included (#355), which described the concern of a local Member of Parliament about the need to protect the Bras D'or lakes from potential mining and

energy developments, and (#347), which announced plans by the St. Mary's River Association to hold a three day seminar on the role of the river in the life of the community.

10. FLOODING

Because the Inland Waters Directorate already possesses detailed reports dedicated entirely to flooding in Nova Scotia, the matter will not be addressed here.

11. SUMMARY AND CONCLUSIONS

The Nova Scotia newspapers surveyed for this report proved to be productive sources of information on several inland water-related issues. The coverage contained clear evidence of an increasing trend toward local control and protection of watershed lands, as well as a substantial amount of quite detailed data on municipal infrastructure problems, water rates, and incidents of contamination. As well, due to the comprehensive nature of the survey, it was possible to discern a relationship between events which the newspapers treated in an isolated manner. For example, it is likely that the province's decision to implement a Stream Bank Stabilization and Protection Program was influenced to some extent by the stalemate between agricultural interests and DFO over the removal of waterway gravel bars to ease erosion. (See Section 7).

However, there were shortcomings, particularly the lack of research and follow-up information. In instances of contamination, for example, the coverage typically contained no consideration of how long a problem may have existed prior to

its discovery, or of its long term consequences to users of the affected water. With regard to individual capital projects, funding sources and cost figures were often omitted.

Overall, this type of survey proved to be of considerable value in identifying the prominent inland water concerns of Nova Scotia. However, this value could be considerably enhanced if future survey information were to be complimented with additional research and follow-up procedures to deal with an abrupt discontinuation in the coverage of an issue, or with the omission of important facts and long term considerations. This combined approach should be given serious consideration in the planning of future surveys or, indeed, as an augmentation to this report.

The following table summarizes the coverage of, and number of communities affected by, the inland water-related issues identified in this report. Some issues had effects which were ambient or regional in nature, making it impossible to assess their impact on individual localities. This is noted in the table. Also, some communities (e.g. Truro) earned mention in several different sections of Municipal Infrastructure or Contamination. In the table, they are counted only once. The number of communities affected by flooding is absent for reasons previously stated. There were 37 clippings on extraneous subjects, such as #332, which describes a smelt fishing tournament.

TABLE NO. 5

SUMMARY OF COVERAGE

SECTION	SUBSECTION(S)	NUMBER OF CLIPPINGS	NUMBER OF COMMUNITIES AFFECTED
MUNICIPAL INFRASTRUCTURE	WATER SUPPLY MANAGEMENT AND PROTECTION	41	17
	OVERALL SYSTEM INADQUACY	35	6
	PARTIAL SYSTEM INADEQUACY	14	4
	COMPONENT MALFUNCTIONS	13	10
	OTHER DISTRUPTIONS	3	3
	FUNDED CAPITAL PROJECTS	70	35 (EXCLUDING 6 REGIONAL PROJECTS)
	PROJECTS SEEKING FUNDING	8	7
	WATER RATES	21	16
		205 TOTAL	98
			-29 MULTIPLE REFERENCES TO INDIVIDUAL LOCATIONS
			69 TOTAL
INLAND WATER CONTAMINATION	POLICY DEVELOPMENT	12	N/A
	GAS OIL LEAKS & SPILLS	9	7
	CHEMICAL CONTAMINATION	8	5
	BACTERIAL CONTAMINATION	5	5
	NATURAL CONTAMINATION	14	6
	SEWAGE AND LEACHATE	11	6
	UNIDENTIFIED CONTAMINATION	7	3
		66 TOTAL	32
			- 7 MULTIPLE REFERENCES TO INDIVIDUAL LOCATIONS
			25 TOTAL

cont'd.

SUMMARY OF COVERAGE

SECTION	SUBSECTION(S)	NUMBER OF CLIPPINGS	NUMBER OF COMMUNITIES AFFECTED
ACID RAIN	INTRODUCTION	4	AMBIENT/REGIONAL
	EFFECT ON FISHERIES, FORESTRY, HEALTH	18	AMBIENT/REGIONAL
	RESPONSIVE MEASURES	16	AMBIENT/REGIONAL
		38	
		+35 NATIONAL AND INTERNATIONAL ARTICLES	
		73 TOTAL	
SPRUCE BUDWORM SPRAY	N/A	10	AMBIENT/REGIONAL
ENERGY WATER USE	ANNAPOLIS TIDAL POWER PROJECT	24	AMBIENT/REGIONAL
	MEDWAY RIVER DIVERSION PROJECT	12	AMBIENT/REGIONAL
	HEAVY WATER PLANTS	8	AMBIENT/REGIONAL
	COAL RECLAMATION PROJECT	3	AMBIENT/REGIONAL
	CARBOGEL PILOT PROJECT	2	AMBIENT/REGIONAL
	GEOTHERMAL ENERGY POTENTIAL	2	AMBIENT/REGIONAL
		51 TOTAL	

cont'd

SUMMARY OF COVERAGE

SECTION	SUBSECTION(S)	NUMBER OF CLIPPINGS	NUMBER OF COMMUNITIES AFFECTED
AGRICULTURAL WATER ISSUES	N/A	29	AMBIENT/REGIONAL
WATER RELATED MINING ISSUES	N/A	23 - 5 COVERED IN ENERGY SECTION 18 TOTAL	AMBIENT/REGIONAL
FISHERIES	N/A	29 -23 COVERED IN CONTAMINATION ACID RAIN AND AGRICULTURE SECTIONS 6 TOTAL	AMBIENT/REGIONAL
FLOODING	-	58	-
		516 +37 EXTRANEOUS ITEMS 553 CLIPPINGS	94 COMMUNITIES